Supplementary Material for Online Publication:

Autonomic Dysfunction in Cardiology – Pathophysiology, Investigation, and Management

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Short Title: Detection and Treatment of Cardiovascular Autonomic Disorders

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Figure Legends

Figure S1 – Orthostatic Vital Sign Assessment

Standardized worksheet for collection of supine and standing heart rate and blood pressure values (orthostatic vital signs), with the diagnostic criteria provided for orthostatic hypotension and postural tachycardia syndrome.

Figure S2 – Head up Tilt Pattern in Different Autonomic Disorders

Panel A – In a healthy individual, heart rate increases modestly with head up tilt (HUT) with no significant change in blood pressure. Panel B – In vasovagal syncope, the blood pressure remains stable with tilt, until it suddenly falls (arrow). Panel C – In neurogenic orthostatic hypotension, the blood pressure falls immediately with head-up tilt, with only a modest increase in heart rate. Panel D – In Postural Tachycardia Syndrome (POTS), the blood pressure is stable with tilt, but the heart rate rises excessively.

Figure S3 – Valsalva Maneuver in Healthy Subject and Neurogenic Orthostatic Hypotension

Panel A – In a healthy subject, the blood pressure initially falls during the strain phase of the Valsalva Maneuver (when the Valsalva pressure is elevated), and then partially recovers. With release of the Valsalva strain, there is a “blood pressure overshoot”, before the blood pressure normalizes. The heart rate climbs during hypotension and falls with hypertension, consistent with normal baroreceptor function. Panel B – In a patient with neurogenic orthostatic hypotension, there is no blood pressure recovery during the Valsalva strain, and after release of Valsalva, the blood pressure slowly returns to normal without an immediate “overshoot”. The heart rate is relatively fixed.

Figure S1

Orthostatic Vital Sign Assessment
(Canadian Journal of Cardiology 2018)

Patient Name
Medical Record Number
Date of Birth
Age

Medications:

Date of Testing:

	Heart Rate (bpm)	Systolic Blood Pressure (SBP) (mmHg)	Diastolic Blood Pressure (DBP) (mmHg)
Supine (minimum >2 min; ideally >5 min)			
Stand – 1 minute			
Stand – 3 minutes			
Stand – 5 minutes			
Stand – 10 minutes			
Orthostatic Change (MAX after 1 min stand – supine)			

Diagnostic Criteria (in the absence of medications that can cause these changes):

- Orthostatic Hypotension (with supine SBP <150 mmHg):
  - SBP drop >20 mmHg or DBP drop >10 mmHg within 3 min standing
- Orthostatic Hypotension (with supine SBP ≥150 mmHg):
  - SBP drop >30 mmHg or DBP drop >15 mmHg within 3 min standing
- Postural Tachycardia in Adults (a criterion for Postural Tachycardia Syndrome)
  - HR >30 bpm within 10 min standing; No orthostatic hypotension
- Postural Tachycardia in Patients <18 years
  - HR >40 bpm within 10 min standing; No orthostatic hypotension

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Figure S2

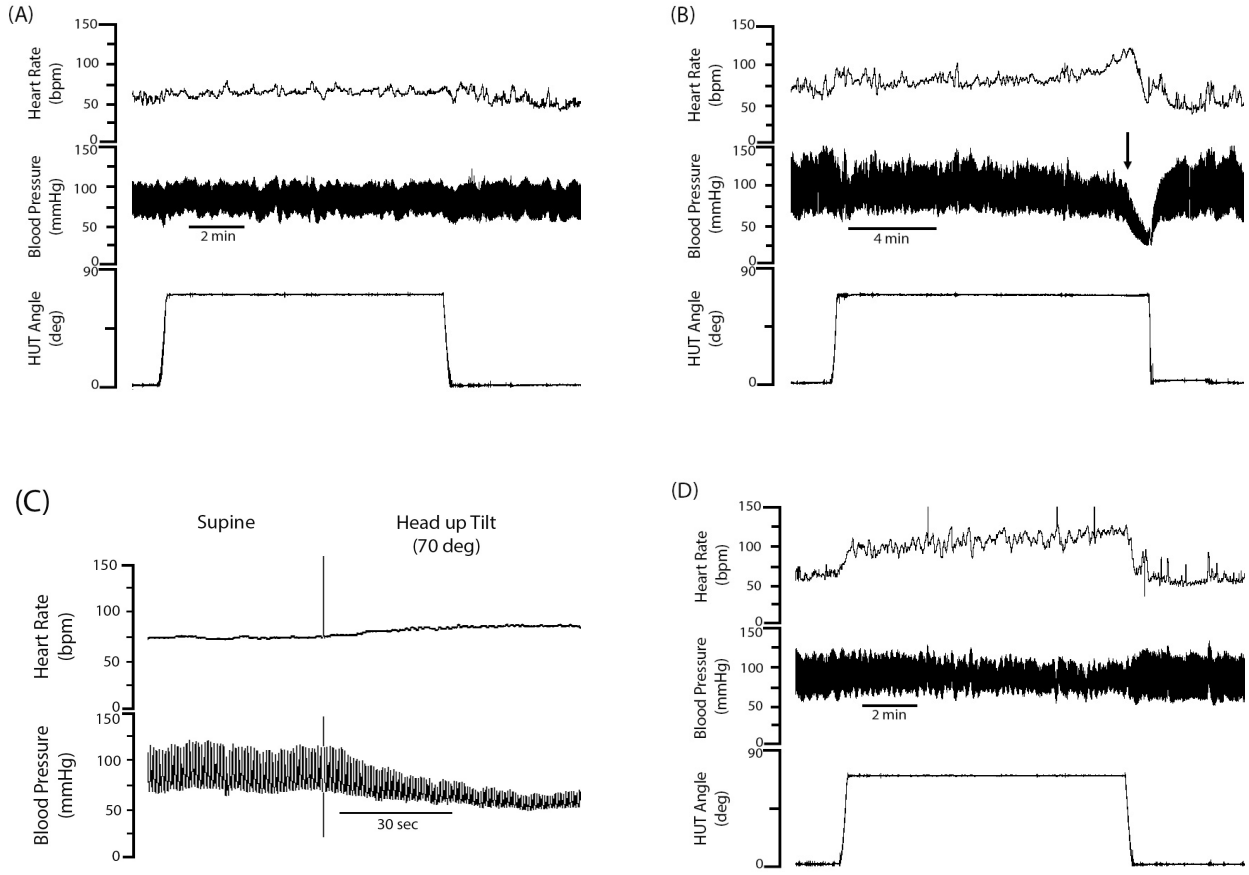
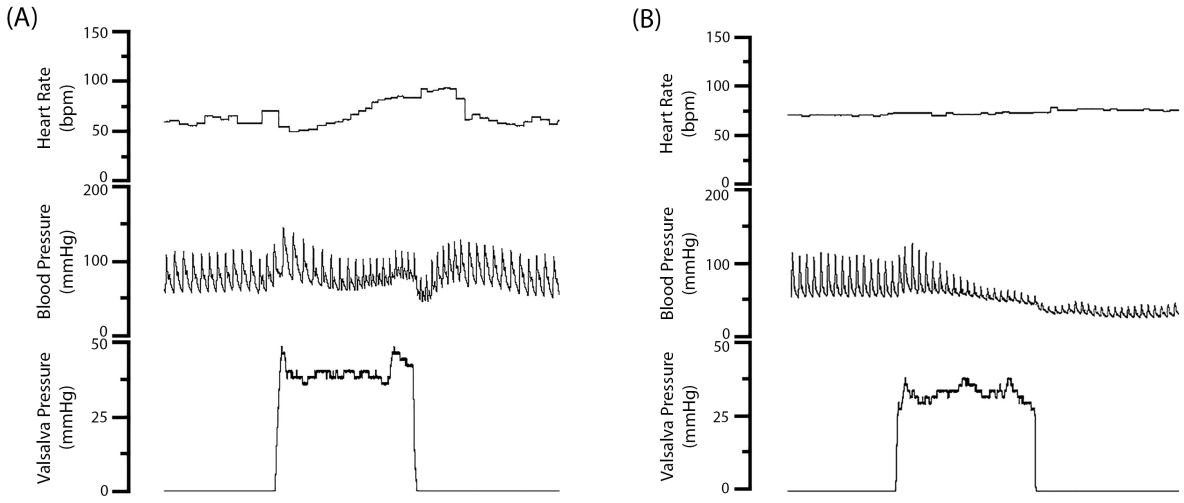

(A)
Heart Rate (bpm)
150
100
50
0
Blood Pressure (mmHg)
150
100
50
0
2 min
HUT Angle (deg)
90
0
(B)
Heart Rate (bpm)
150
100
50
0
Blood Pressure (mmHg)
150
100
50
0
4 min
HUT Angle (deg)
90
0
(C)
Supine
Head up Tilt (70 deg)
Heart Rate (bpm)
150
100
50
0
Blood Pressure (mmHg)
150
100
50
0
30 sec
(D)
Heart Rate (bpm)
150
100
50
0
Blood Pressure (mmHg)
150
100
50
0
2 min
HUT Angle (deg)
90
0

Figure S3


(A)
Heart Rate (bpm)
150
100
50
0
Blood Pressure (mmHg)
200
100
0
Valsalva Pressure (mmHg)
50
25
0
(B)
Heart Rate (bpm)
150
100
50
0
Blood Pressure (mmHg)
200
100
0
Valsalva Pressure (mmHg)
50
25
0